

Threats/Issues and Conservation Actions

Barrens Community Group

This is a summary of threats/issues and conservation actions that are common to all or most of the community types¹ in the barrens community group. As much as possible, the source of the threat is described as well as the stresses or effects that occur directly or indirectly as a result of the threat. Stresses are generally thought of as loss, conversion and/or degradation of the natural community. Distinguishing the **source** of the impact from the **effects** that occur to or in the community is important because the two typically need a different approach and set of conservation actions. Multiple sources of impact may have the same or similar effects on a community. Similar effects may be addressed collectively by a single action or suite of actions.

The barrens group includes the following community types:

- Oak Barrens
- Pine Barrens
- Sand Barrens

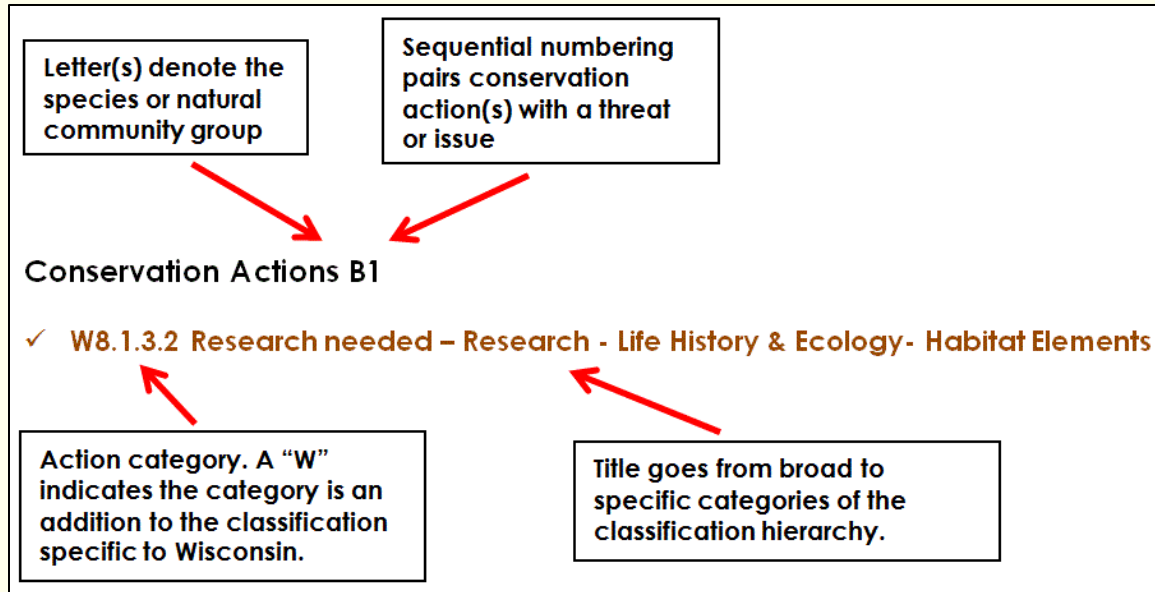
Descriptions for these community types can be found online.²

Conservation actions for most or all barrens community types are organized according to categories in the [Conservation Actions Classification](#) based on the Open Standards threats and actions classification³. If the threat/issue and its associated conservation action(s) apply to one or a few species they are identified as such. Conservation actions overlapping in content or scope may be grouped under a single code. Coding and identification for each action category are explained further below.

¹ Community or natural community is used in the WWAP as a proxy for habitat.

² <http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=group&Type=Barrens> (Search Terms: Barrens Communities Wisconsin DNR)

³ See the following website for the classifications. <http://cmp-openstandards.org/tools/threats-and-actions-taxonomies/> (Search Terms: open standards conservation threats actions). The conservation actions classification is provided in Appendix 2.1.



More about how threats and issues or conservation actions were developed, opportunities to provide input on this topic, and how this information can be used to make conservation decisions can be found on the [Conservation Actions and Effectiveness Monitoring](#) page or in [Sections 2 and 4.4.2](#) of the Wisconsin Wildlife Action Plan.

Threat/Issue Ba1

One consistent element of all barrens is their dependence on fire and the major role that fire plays in their dynamics. Fires have burned on Wisconsin barrens for thousands of years. Prior to Euro-American settlement, some fires were caused by lightning. Others were set by Native Americans to maintain game habitat, drive game, and enhance fruit and berry crops. Historically, behavior of fire was greatly influenced by topography and soil factors. Natural wildfires usually produce a complex mosaic of burned and unburned patches depending on fire intensity, topography, soil moisture, and local weather. However, since the early part of the 20th century, fires have been actively suppressed to limit damage to timber, crops, and property. In addition, farms and networks of roads have fragmented the landscape, and fires that do occur are smaller in extent than in historical times. Overall, fire suppression greatly alters fire-dependent barrens.

Lack of fire leads to overall ecological simplification through changes such as:

- the encroachment of shrubs and trees,
- higher canopy coverage from trees and shrubs,
- decreased light availability to the ground layer and resulting decreases in flowering, fruiting, and survival of light-loving ground layer plants, and
- buildup of dense thatch (including Pennsylvania sedge in some sites).

- in addition, some recent research suggests lack of fire reduces the resiliency of fire-dependent systems to climate change by reducing drought tolerant species and drought-tolerant traits.

Conservation Actions Ba1

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓5.3 Law and policy – Private sector standards and codes

Restore oak and conifer barrens and shrub habitats through fire, brushing, ground layer enhancement, and timber management.

Manage the full range of barrens successional stages and diverse habitats in a landscape context by techniques such as using large burn units to allow for variable fire intensity, using variable density thinning (if conducting timber harvests as part of restoration), etc.

✓8.1.6 Research needed – Research –Actions

✓8.3.1 Research needed – Monitoring – Population trends

Evaluating the potential effects to invertebrates should be routinely considered in plans to use fire for restoration or management of this community type. The frequency, intensity and area burned should be planned considering the life history, habitat needs and distribution of fire-sensitive invertebrate species both on the subject property and adjacent habitat. In cases where burning is the preferred community management tool, but invertebrate species impacts are undetermined or potentially significant, the feasibility of creating refugia should be examined as should alternative methods for invasive, shrub and canopy management.

Quantify and monitor the positive and negative impacts that prescribed burning and other management activities undertaken in grassland, barrens and savanna communities have on SCGN invertebrates to improve management decisions and techniques and improve intended outcomes.

Threat/Issue Ba2

Barrens have been fragmented by a wide variety of land use changes, including conversion of former barrens to pine plantations, agricultural fields and pasture. In addition, forest management goals that do not take barrens or early successional habitat into account can cause fragmentation over many generations for SCGN by allowing barrens to grow up into forest.

Fragmentation disrupts the movement of animals dependent on barrens habitats, and renders habitat unsuitable for species dependent on large areas of barrens. For example, sharp-tail grouse require large blocks of open barrens. Dwarf milkweed (*Asclepias ovalifolia*) is a rare clonal plant that requires genetically diverse clones spread across a local landscape accessible to pollinators. Pollinators also require sufficient diversity of other flowering plants for nectar. Fragmentation makes scattered



habitat patches inaccessible to pollinators which in turn limits milkweed outcrossing, thus threatening the viability of the species. Finally, fragmentation also makes large-scale habitat management using prescribed fire difficult.

Conservation Actions Ba2

✓W8.1.7 Research needed – Research - Natural community inventory and ecology

Prioritize identification of new barrens sites with moderate to high restoration potential.

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

Restore barrens, pine-oak forest, and shrub-dominated habitats on sites such as old fields and pasture lands with the goal of expanding and connecting existing stands.

✓W2.4 Land/water management – Comprehensive management

Integrate management of dry forests and barrens on appropriate sites by aggregating harvest units to create larger open areas and to connect otherwise isolated forest patches. This can then accommodate both area-sensitive barrens species as well as forest species and conifer specialists.

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓5.3 Law and policy – Private sector standards and codes

Restore oak and conifer barrens and shrub habitats through fire, ground layer enhancement, and timber management.

Manage the full range of barrens successional stages and diverse habitats in a landscape context by techniques such as using large burn units to allow for variable fire intensity, using variable density thinning (if conducting timber harvests as part of restoration), etc.

Threat/Issue Ba3

Barrens occur on easily eroded sandy soils. Activity that directly disturbs soil is especially problematic, including motorized vehicle use or heavy foot traffic on sensitive soils on slopes (i.e., on current or old dune fields). Soil disturbance frequently creates openings for invasive species, especially along corridors. Soil disturbance destroys existing vegetation, increases erosion, and often leads to the spread of invasive plants, either directly through seeds spread on tires or boots, or indirectly by a corridor of mineral soil easily colonized by spotted knapweed, non-native hawkweeds, and invasive grasses. Once invasive have gained a foothold, they can easily spread across a site.

Conservation Actions Ba3

✓1.2 Land/water protection – Resource and habitat protection

✓8.2.2 Research needed – Conservation planning – Area-based management plan

Utilize comprehensive planning to concentrate areas of operation of motor vehicles and off-road vehicles in barrens and bracken grassland restorations that leads to invasive plant establishment, wind and storm erosion, or dominance of Pennsylvania sedge.

Utilize comprehensive planning to concentrate areas of hiking and other causes of vegetation trampling in communities with fragile sandy soils.

Threat/Issue Ba4

Barrens communities are projected to have moderate to moderately low vulnerability to climate change, as they are already adapted to stressors such as drought and high temperatures (Climate Change Vulnerability Assessment Workshops 2014). Prescribed burning can help increase resiliency by promoting species and characteristics adapted to drought. However, repeated or extended droughts may adversely impact some forb species. Pests and diseases that are exacerbated by climate change (such as mountain pine beetle) may adversely impact certain species such jack pine, and, along with higher temperatures, could cause shifts away from pine and toward oak-dominated barrens. Overall, barrens are thought to be among the least vulnerable group of communities to climate change.

Conservation Actions Ba4

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓8.1.6 Research needed – Research –Actions

Conduct prescribed burns to promote fire and drought-adapted species

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓5.3 Law and policy – Private sector standards and codes

Manage the full range of barrens successional stages and diverse habitats in a landscape context by techniques such as using large burn units to allow for variable fire intensity, using variable density thinning (if conducting timber harvests as part of restoration), etc.

✓8.1.5 Research needed – Research – Threats

✓8.1.6 Research needed – Research - Actions

Identify methods to reduce risk of mountain pine beetle arrival, spread, and mortality rate on jack pine.



Estimated Vulnerability of Barrens Communities to Climate Change under Low and High Change Scenarios

Community type	Vulnerability under Low degree of climate change	Vulnerability under High degree of climate change
Pine Barrens	Moderate	Moderate
Sand Barrens	Moderately low	Moderate
Oak Barrens	Moderately low	Moderately low

Source: WDNR Climate Change Vulnerability Assessment Workshops 2014.